Data Recommendations from the LCLUC Science Team

- Landsat style observations are essential to the success of the LCLUC program.

- Continuity of Landsat style measurements between now and the launch of LDCM is not assured and NASA should seek to fill this data gap through a virtual constellation that includes international assets. In particular, NASA should be prepared to provide observations to support a 2010 global decadal survey.

- We endorse the transition of the Landsat Program to operational status and advocate improved security of measurement scenarios through use of a constellation of satellites. A single Landsat-style satellite is not a sufficient sensing scenario for terrestrial monitoring.

- The single greatest improvement to our ability to monitor change at the earth's surface is an improvement in temporal resolution at Landsat scales.

- The success of the LCLUC program remains dependent on continued production of science quality products from MODIS and eventually VIIRS, including sufficient overlap between the two to facilitate intercalibration.

- As land observations migrate to operational status, we encourage NASA to ensure coordination across scales and wavelengths in support of land science.

- We endorse the recommendations of the NRC Decadal Survey with respect to the need for a future mission that includes lidar and radar.

topics

- Related community efforts/events/recommendations
- Preliminary evaluation of gap filling
- Expanded role for the Landsat Science Team

- *LCLUC Science Team Action Items*

  - 1.	letter to USGS re opening archive
  - 2.	letter to FLI regarding coordination across scales and sensors

Geo Task DA 07-02 (in support of UNFCCC)

- Provide a suite of global land cover datasets, initially based on improved and validated moderate resolution land cover maps and eventually including land-cover change at high resolution.

# Evaluation of Gap-Filling in SLC-off L7 imagery

- Trying to understand the magnitude of errors in gap-filled products (ie the difference between the values that would have been observed and the values used to fill the gaps)
- Using a simulation approach by artificially overlaying the pattern of gaps typical in SLC-off imagery – and then using a different image to fill the gaps –
- RMSE between observed and "fill" values
- Images and help from Jim Storey – EDC
- Can we estimate the magnitude of the errors in filled gaps using variograms from the images???
- Hope is to develop a simple method that people could use to estimate the magnitude of errors they might see in specific images

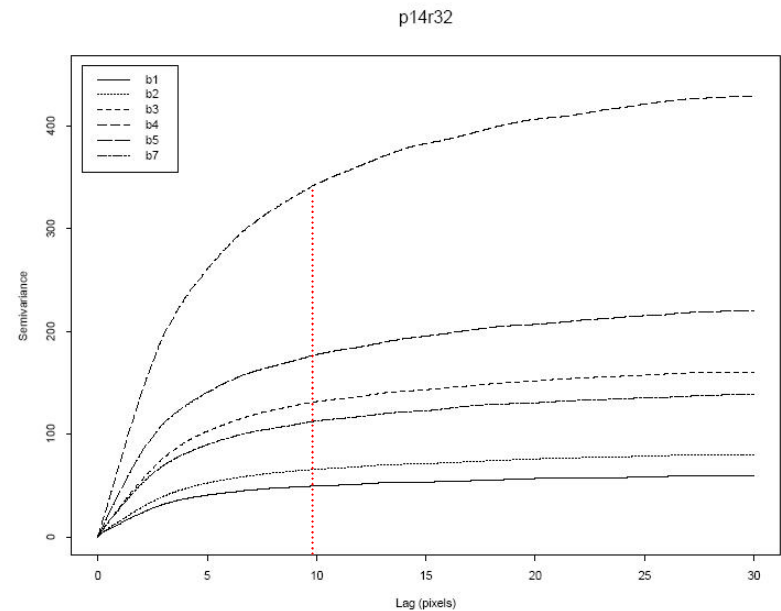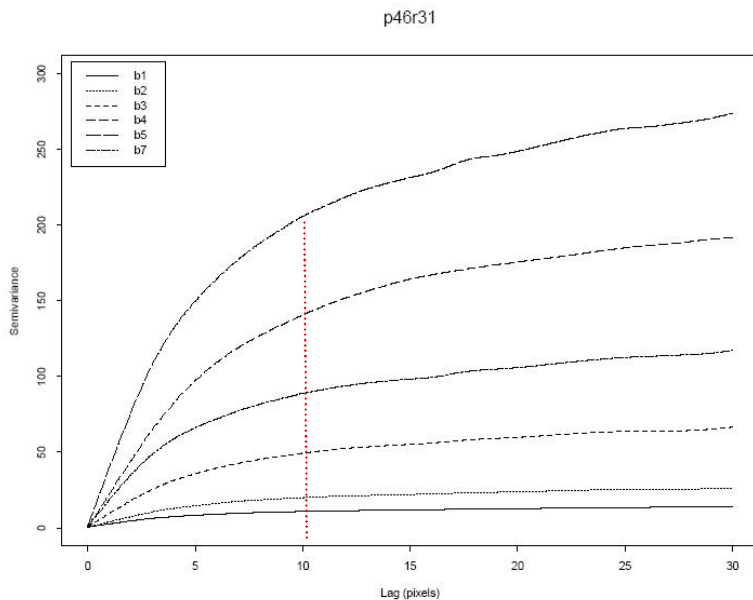Variograms for different ETM+ Bands

p14r32
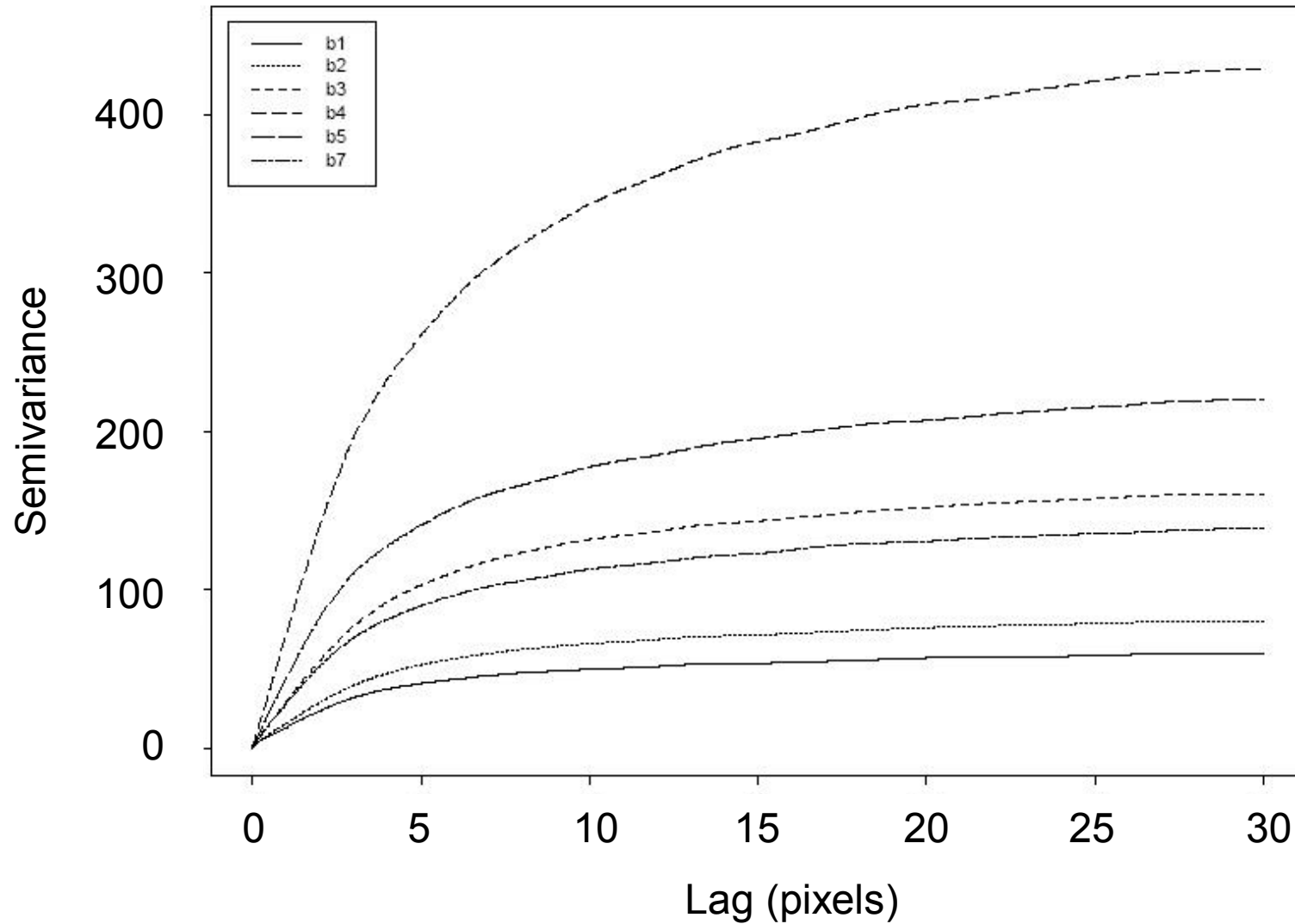
Effectiveness of different lags from variograms for estimating the magnitude of errors in SLC-off gap filled products
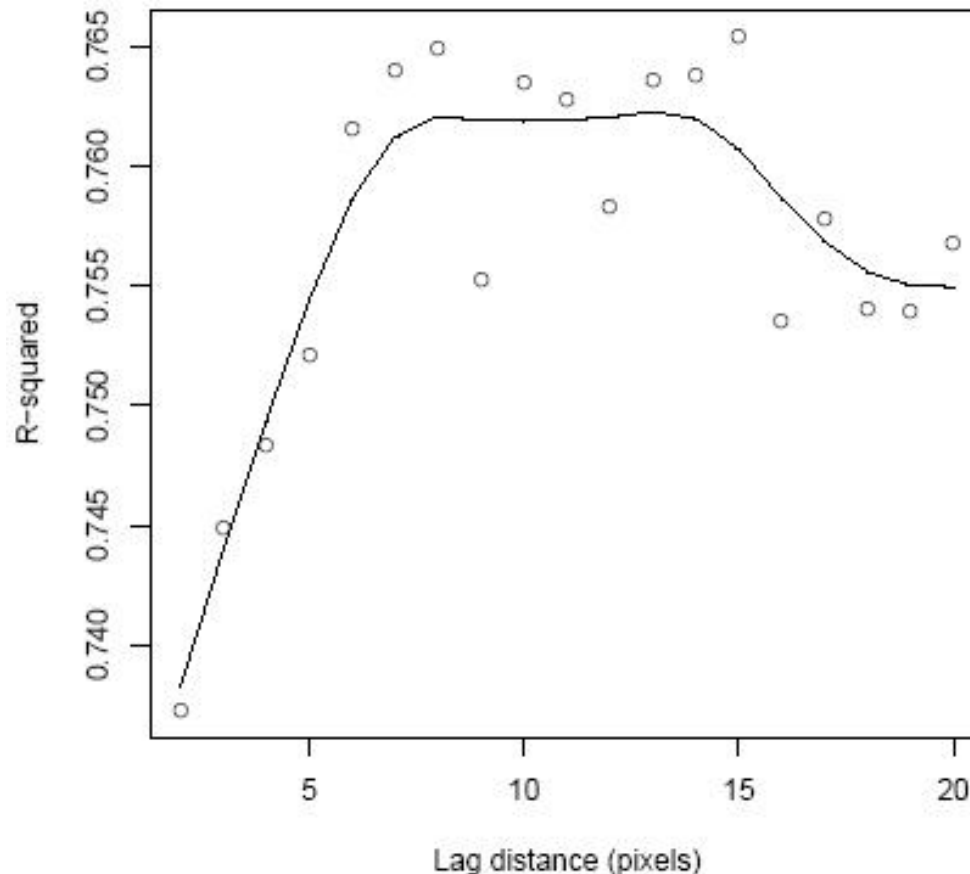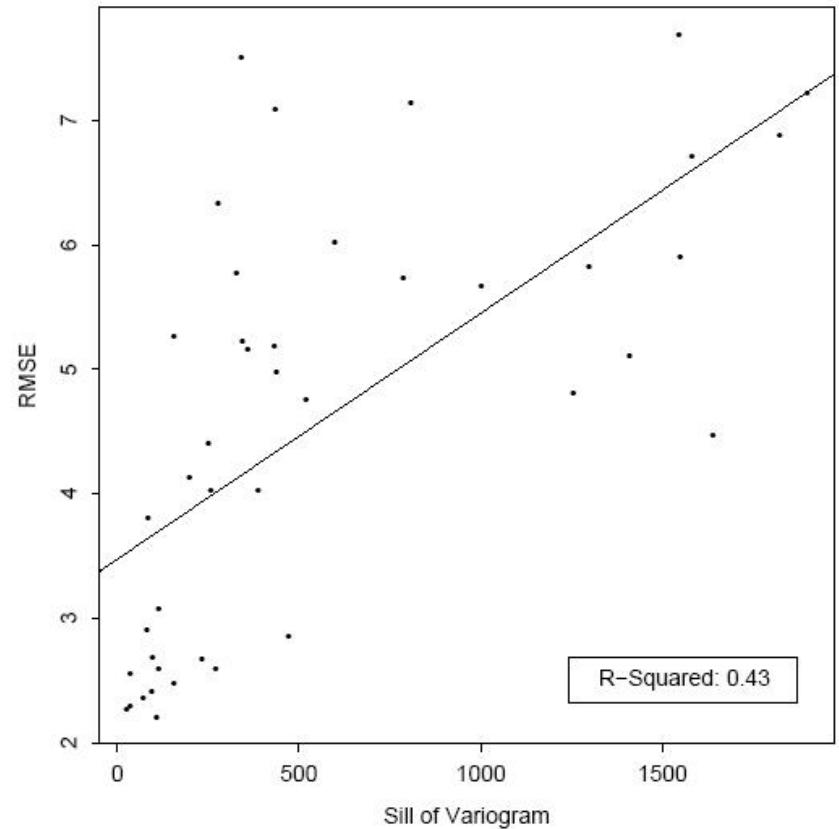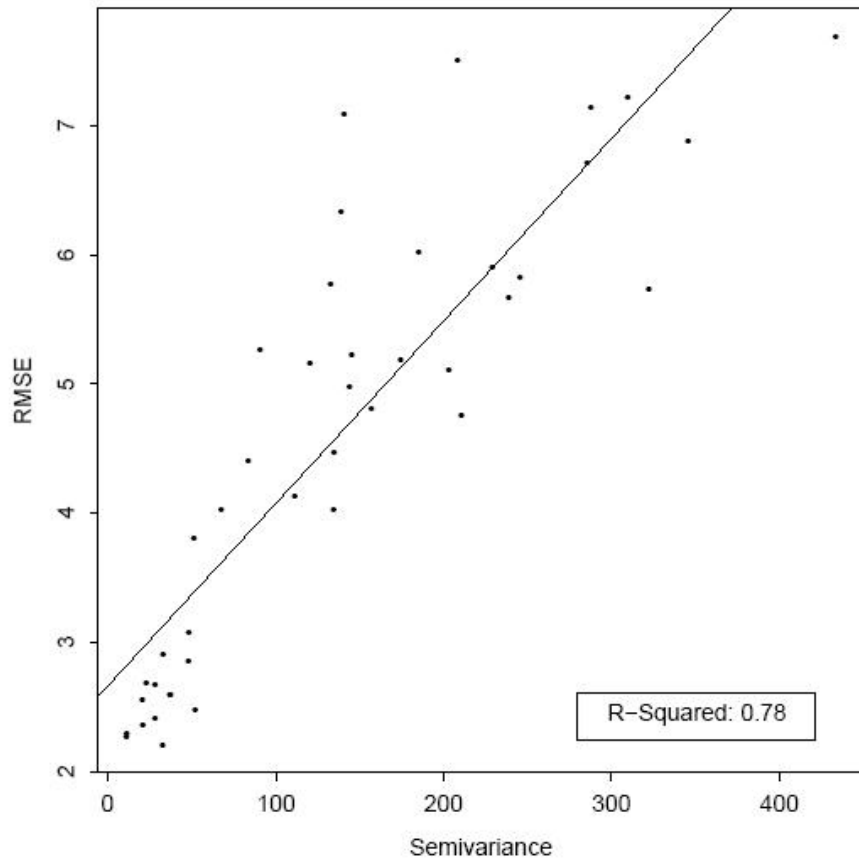

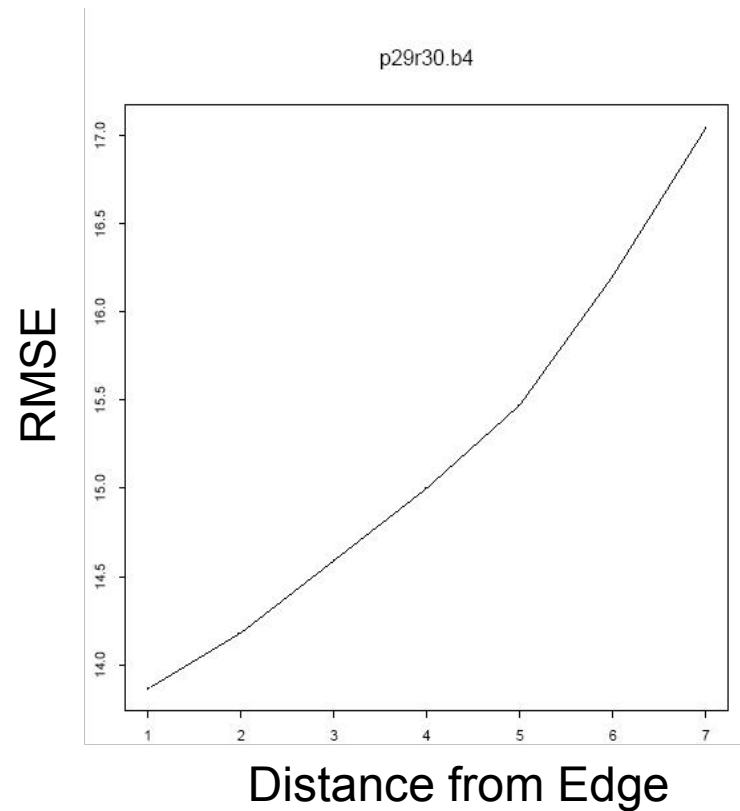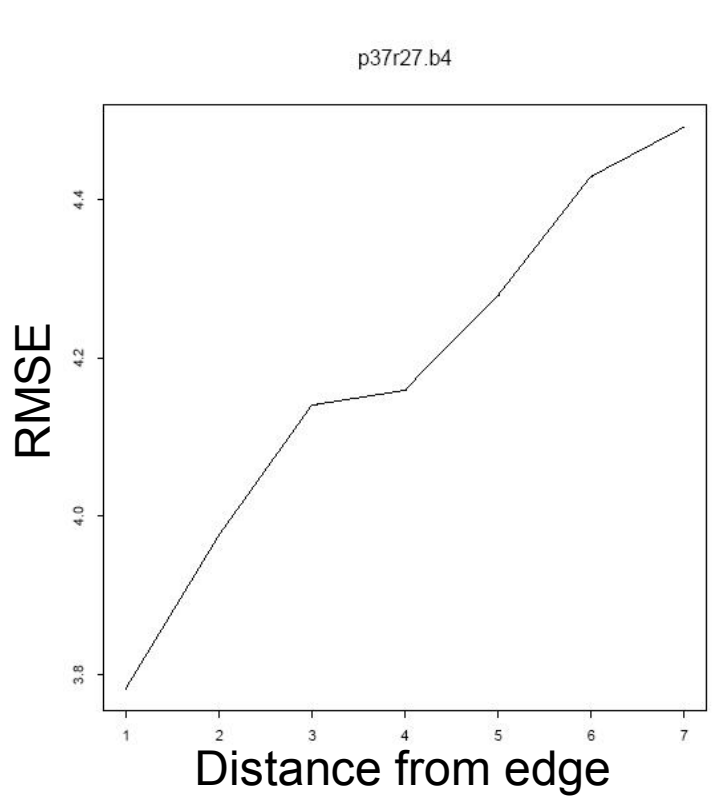Notice that lags of between about 6-12 pixels work well

Variogram values at a lag of 10 pixels were used in a simple linear regression to estimate error magnitudes (RMSE)

Simple regression results: lag 10 results much better than the sills (R-square of .78 vs .43)

Magnitude of errors related to the distance from the edge of the gaps

If you exclude images with clouds and those with dynamic agricultural settings (lots of surface change between dates used to fill gaps, it is possible to estimate reasonably well the magnitude of errors in gap filled products using data from variogams derived from the images
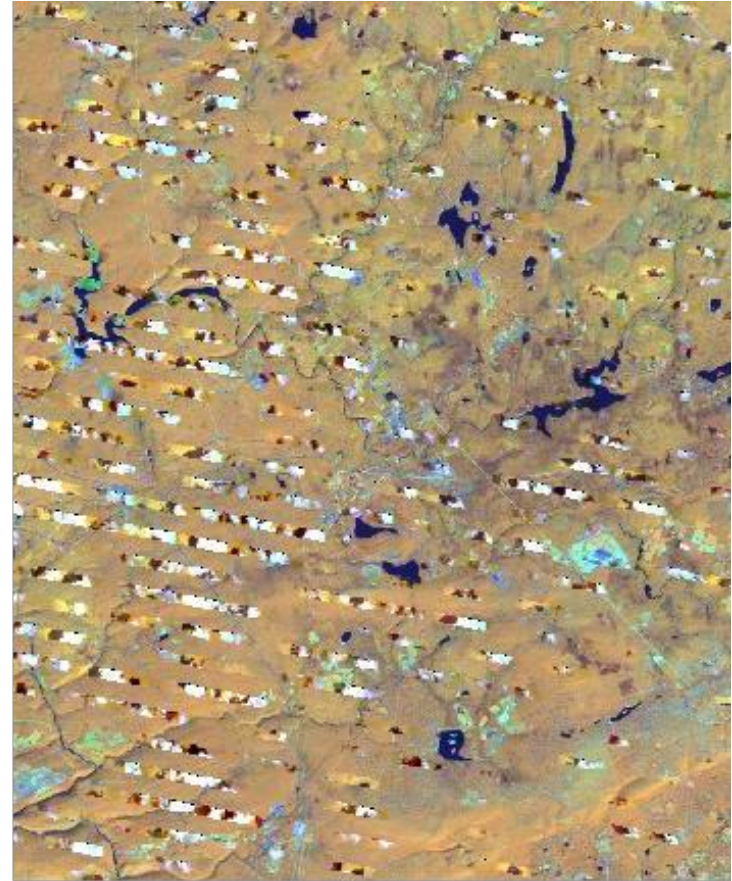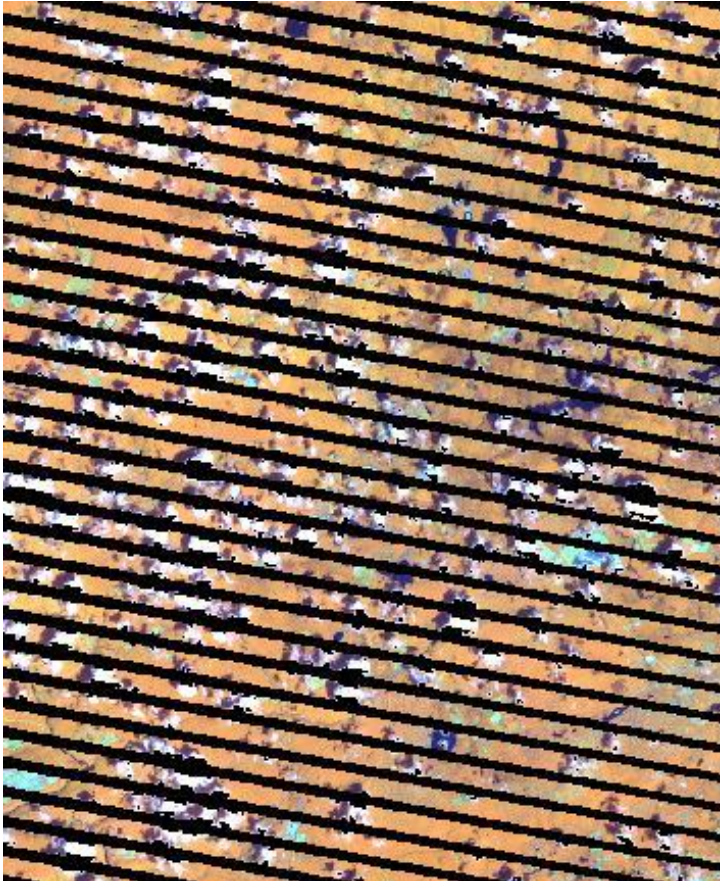
New challenges/opportunities for the Landsat Science Team

- Tremendous amount of good news associated with LDCM (bands, radiometric resolution, access to data, acquisition strategy ….)

- Good news leads to a new set of strategies/opportunities

- Influence data policy and the nature of the data products

  – Project 4 years into the future

  – Based on spectral bands we've never had

  – If some forms of Landsat and eventually LDCM data are available at no cost and there are limits within USGS, should we (as a science team) begin to think about providing alternative forms of products (historical time series)